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ABSTRACT

Student volunteers at Utah State University's outdoor program designed, built, and carried a yurt 4 miles into the backcountry. A yurt is a traditional Mongolian structure, circular, with a lattice wall covered by material. Rafters slope upward to a top ring, on which sits a skylight. The outdoor program wanted to expand its offerings, and to do that it needed its own inexpensive shelter located relatively close by. This yurt was also built to teach about passive solar design and sustainable living. After a fairly detailed description of how the yurt was built, its uses are discussed. The first year was an informal "open house" for the yurt. Most of its use came from those who helped build it, but it was rented to other students, staff, and faculty. The yurt is used as a ski hut and backcountry classroom for teaching mountaineering; winter ecology; telemark skiing; and the special adaptations that plants, animals, and humans make to survive the winter. Learning about snow is also a critical element during these courses. Students dig snowpits and record information on snow temperature, stratigraphy, hardness, density, and resistance. They also test the snowpack to detect weakness, and build snow shelters and sleep in them. Through knowing the principles of winter ecology, it is hoped that students will gain an increased appreciation of how living systems are connected, and how humans are connected to these same living systems. The outdoor program's website address is given. (TD)

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"Building a Backcountry Yurt: *Ecological Design Intelligence* Within Outdoor Programming"

by

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Abstract:

This project involved designing, building and carrying a structure called a yurt four miles into the backcountry. Sound whacky? The Utah State University Outdoor Program's yurt isn't just your average yurt. It was designed, built, and hauled in by over sixty student volunteers, "The Friends of the Yurt". It has a passive and active solar system and cost less than an average raft. Through the first winter, the yurt was used mostly for a ski hut. Current and future plans will use the yurt as a classroom to teach "relationships" to not only humans, but how plant and animals adapt to a subalpine environment.

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PREFACE

Connections, some rigid like trees and soil, others loose like birds and air, built this yurt (Of course there was some creative imagination and good old hard work). Norman Goltra worked harder than a horse when asked to create something from brain dust. He knew how to swing a hammer, but when he was asked to build a community, he thought for a minute, maybe two, and said, "I'll start on it today."

INTRODUCTION

What is a yurt? A yurt complete is comprised of a circular floor, (although not always necessary, often times a yurt is placed directly on the ground), on which sits a lattice wall covered by some sort of material. Traditional yurts used in Mongolia use the hides of animals. Most modern yurts use canvas, vinyl-coated nylon, or a combination of the two.

Rafters are secured to the top of the lattice wall and slope upward to a wooden top ring, on which sits some sort of sky light. Rafters are made from dimensional lumber, tee pee poles or similar pole-sized wood. A cover material rests over the rafters, which usually slope at about thirty degrees in steepness from the top to the bottom.

TO BUILD A YURT

Why Build a Yurt? Winter offerings sponsored by the USU Outdoor Program were pretty slim, usually consisting of a winter camping trip, some slide shows and two or three yurt trips. These trips were to either the yurts in the Tetons operated by Rendezvous Ski Tours or yurts in the Logan area mountains operated by Powder Ridge Ski Touring.

There were a handful of reasons behind the need to own and operate our own yurt. First, renting yurts is too expensive for your average college student. Second, driving far distances in the winter is dangerous, and perhaps not too wise in our case, with local mountains at our doorstep. Lastly, most of the academic year it is winter in the mountains and if we wanted to get students involved in our program, it will have to have snow as a main component.

Why a Yurt? Yurts are inexpensive, usually costing much less than an average outfitted raft (if owner-built). This was very important to us, due to a small budget. Secondly, yurts are quite conducive as a teaching tool. They can be built to teach about passive solar design and sustainable living. Finally, they are functional, making moving one relatively easy. An important reason for why we chose a yurt, is that, well-designed, the beauty of being in one sends out ripples of beauty from it.

The Floor. Once we decided to build one and were granted permission from the U.S. Forest Service, the floor was the first thing to design. Being early July at this time, September (when we wanted to set it up for the returning student body), seemed as distant as Alaska. So did designing, building and hauling this collection of boards, poles, fabric, bolts, door pieces, bunk beds, etc. But the fact of the matter was, we had three months to turn an idea into a well-designed yurt and then beam it up high near a mountain pass where the closed road was about three miles away.

Norman had lots of framing and carpentry experience. You could tell. He had the floor designed on graph paper by the end of the first day. It was

complete with a materials list too. From the plan, Norm knew exactly what boards, screws and hangers we needed to purchase (after scrounging around first of course).

The floor joists started with four two by sixes of equal length, shaped like a cross, held together by hangers and plywood gussets. We worked hard and deligently, all of this floor and yurt was being constructed and assembled inside the campus fieldhouse. Users of the fieldhouse were somewhat confused by all the racket.

Twenty hours later the floor, all three hundred and fourteen square feet, as round as the full moon, was finished. It went quick, but it was big and solid, like a stage ready for some musicians. We figured it weighed over a half ton. We also were somewhat miffed at how we were going to carry it three miles and a couple thousand vertical feet.

The floor haul. News about the yurt was starting to spread and soon we recruited about twelve friends, the very first members of the "Friends of the Yurt", as they would soon be called. Our first task was to drive up a five mile four-wheel drive jeep road, load this floor in packs, on shoulders, drag, and do whatever it took to get this floor to the site. There were no big plans now, no technique or skill nor books or guides on the subject of floor-hauling.

The trail smelled like cow crap and aided by a fine powdery dust, the rank lined the inside of your nostrils. No fortune lightened anyone's load except those who had some oxygen remaining to dream and imagine why we were doing this. But some could almost picture a hut, warm, glowing, in a meadow deep and silent in snow. Some could.

It proved to be a long day. A small band of haulers took a wrong turn and ended up hiking some umpteen thousand vertical feet loaded with floor boards and a chain saw. There was some red-faced individuals who cursed at themselves quietly. Whatever the measure of a good days' work is, this collection of individuals could have re-defined it.

The yurt site. Picking the general site for the yurt was the result of spending many long days ski touring in and around this area. Some important considerations included how far and high was the site from the trailhead. If it was too close, it would be just that, too close to the road. If it was too far, it would be out of the question for hauling it in, maintaining it, and getting users in to the yurt without killing them.

Picking the specific site was determined by its orientation to the sun (for passive and active solar heating and lighting). The sun had to shine on the site for the better part of a day, even in the mid winter. There had to be a gentle north to south slope so we could have a better chance of using the snow as a wind buffer on the north side while maximizing the height off the ground on the south side to keep the passive solar windows clear of snow.

The site also was located near different slopes for skiing and snowboarding. Most importantly, the site was picked because it was the furthest place from any motorized recreation areas. We wanted to study and appreciate the winter without being distracted or disturbed by noisy snow machines and similar vehicles.

The yurt skeleton. We used about fifty yards of "Coverlite" material, a waterproof, non-breathable fabric which river bags are also made from. But it first had to be designed on paper. Materials had to be ordered and then they had to be cut and sewn together. Nan Vance walked in the Outdoor Recreation Center just at the right time. She had sewn for a backpack company and agreed to take on this project and without her, we would have been in trouble.

The wall material was designed to have over twenty-five feet of clear

vinyl windows, able to be left opened or covered and secured if needed. The wall was over sixty feet long and proved cumbersome to feed through a sewing machine (multiple times). But some long days and nights and the wall material was finished. The cover needed to be designed with windows to match the wall. The windows also had to be able to be left opened or covered and secured. This proved to be a time consuming job, as thirteen triangles with curved tops and bottoms had to be cut and sewn together, some of them with clear vinyl and covers.

The lattice wall. We used clear grained one by six poplar. Using a borrowed table saw, we ripped the large lumber into 116 pieces. All of them were drilled with holes for small bolts to create the lattice. Volunteers helped sand and varnish the individual pieces before they were fastened together.

The rafters and top ring. Rafters can be made from dimensional lumber or for a more rustic look and feel, you can use tee pee poles made from lodgepole pine. We obtained a permit from the U.S. Forest Service and spent a day driving down to the north slope of the Uinta Mountains and cutting lodgepole pines and then driving back. For the yurt we used a total of forty-four poles. First, they were stripped of bark using a draw knife. Second, they were sanded lightly and finally, they were varnished.

The top ring was made from salvaged two by sixes. We obtained these boards from a university remodeling project. The top ring is a series of small two by six pieces bolted together to form a rough circle. Using a saw, we then sawed off the edges to create a circular edge. Holes were drilled in the edge for the rafters.

The door and door frame. The door is 60" high by 51" wide. Plywood was used for the door and there is a diagonal window in door and the door is insulated with salvaged sleeping bag insulation. Door opens in to yurt. The door frame is made with tee pee poles in a tongue and groove fashion. Gussets at corners for torsional rigidity. We lock the yurt with a hasp located on the outside of the door. There is a rough gate and latch assembly for inside to secure door from inside.

Misc. There are many small items that we used to complete the yurt. The list would be too large and reading it would be pretty boring. Some of the things excluded from this paper are: the liner for the inside of the yurt, the plastic dome (skylight), the cable which rests on top of the lattice wall, the bunkbeds, woodstove, and other odds and ends. For interested persons, we will sell plans to the yurt. Please write at the address at the start of this paper.

TO SEE PICTURES OF THE YURT PLEASE VISIT OUR HOMEPAGE:
http://www.usu.edu/orc/

WHAT WE USE THE YURT FOR

"Open House" for the yurt. We didn't have any major plans for the yurt the first season. We expected it to be an "open house" for the yurt. We simply wanted people to get to know what a yurt is and what it isn't. We also wanted people to explore some of the terrain adjacent to the yurt. Most of its use came from persons who helped build and haul the yurt in. We also rented it to other students, staff and faculty at Utah State University. As you can see by the following numbers, the first year of the yurt proved to be pretty busy.

Total Number of Participants

Yurt Construction:	179/41%
Yurt Use:	259/59%
Total:	438/100%

Total Number of Participant Hours

Yurt Construction:	1480/14%
Yurt Use:	9256/86%
Total:	10,736/100%

Total Number of Participant Days

Yurt Construction:	151/28%
Yurt Use:	389/72%
Total:	540/100%

So, the average time spent by a participant involved with the yurt was: 10,736 participant hours divided by 438 participants= 25 hours per participant.

Selected quotes from the yurt journal

"Last night we saw lots of shooting stars up on the saddle...To all who helped with this yurt, I salute you." Brian Shaw

"We opened the yurt door and the warmth from within pulled us into its soothing grasp...Smiles and laughter will make it our home for the next few days..." Amanda Thimmes

"The yurt is great, perhaps I will move in and change the locks." Brenda Milligan

"Hello, I found something once lost." Aaron Atkinson

"Hey, it's not that cold. I slept in only two layers...and I didn't freeze...to death. This is the most amazing place I have ever been to! This is such a beautiful area! Thanks...for giving us this experience! Jamie McEvoy

Informal classes and theme trips at the yurt. Besides using the yurt as

a ski hut we also used the yurt for one class, ski mountaineering. Students spent the first night in the yurt and the second night was spent in snow caves high up on the divide that separates Logan Canyon and Cache Valley. The surrounding terrain around the yurt makes it perfect for teaching the basics of mountaineering. There are steep gullies for teaching ascending, descending, cramponing and crevasse rescue. The class ends by skiing down a canyon where they are picked up by an Outdoor Program employee. It is the objective of the class to introduce the basics of mountaineering so that graduates can move to other, perhaps more challenging peaks.

Additionally, the yurt was used by the Outdoor Program which sponsored an all-womens trip. The trip was full and went very smoothly. Apparently, the group talked all night long about everything.

THE NATURAL STEP

The yurt as a backcountry winter classroom. It was quite obvious that the Outdoor Program could build a unique education program using the yurt as a classroom. We are planning to use the yurt for six classes during the winter of 1996-97. Three of these classes will use the yurt for teaching telemark skiing and mountaineering. Three other classes will zero in on winter ecology, the special adaptations that plants and animals (and humans) make to survive the winter.

The winter ecology classes will spend two evenings in a lecture style to introduce winter ecology, and explain what will take place up at the yurt. Each class will spend a Friday through a Sunday at the yurt. During that time the students will sit and observe for two hours and write down what they observe. Additionally, students will ski along on different transects to record everything they see.

Learning about snow is also a critical element during these courses. Students will dig snow pits and record information on snow temperature, stratigraphy, hardness, density, and resistance. They will also perform various tests on the snowpack to detect weakness in the snowpack.

Along with snowpits, students will have the opportunity to build different snow shelters and sleep in them. Permanent snow caves and quinzhees will be constructed around the yurt. We wil use these structures to demonstrate the thermal properties of snow.

Our hopes are that students will start to understand relationships between our lives at the yurt and the lives of the plants and animals that use the area around the yurt.

From the field to the home. Filled with information about how living systems interact, we are hoping students will gain a greater appreciation of our place in these systems. From the subtle understandings of how we fit in up at the yurt site, we are hoping that we can instill this connection to a larger context. That the yurt is part of a watershed that is connected to the watershed that feeds and nourishes Cache Valley, the place where our community is located, including Utah State University.

We are offering lists of local groups who are working to protect the areas in and around Utah State University. These groups range from high school student groups to professional environmental action groups. Talking about these groups will be part of the curriculum in our classes that use the yurt. Hopefully, a "prairie fire" effect will begin to emerge and combined with other groups, a collective effort to protect our place will take hold.

SUMMARY

The yurt has offered many rewarding experiences. From the start, we have worked hard on a good design fully knowing that if we got it right, good things would ripple out from it. If we got it wrong, well, that just wasn't an option. The good things have started.

We have met many new students who are willing to sweat and toil to accomplish a worthy goal. During the first year, the area and the yurt were new and the use at the yurt felt like an "open house". With every passing moon, however, the yurt is being used more and more as a backcountry classroom to teach about winter ecology. Specifically, through knowing the principles of winter ecology, students will likely gain an increased appreciation of how living systems are connected. And how we, as humans, are connected to these same living systems.

Lastly, we will not attempt to "push" environmental action to the student. Our hopes are that a student, given primary experiences at the yurt, will understand how we fit into a living system, thus increasing ones innate connection to nature.

> *We cannot win this battle to save species and environments without forging an emotional bond between ourselves and nature as well-for we will not fight to save what we do not love.*
>
> -S.J. Gould